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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,791	01/15/2004	Manoj Singhal	15155US01	5464

7590 12/15/2009
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EXAMINER

NEWAY, SAMUEL G

ART UNIT	PAPER NUMBER
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2626

MAIL DATE	DELIVERY MODE
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12/15/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/757,791	Applicant(s) SINGHAL, MANOJ	
	Examiner SAMUEL G. NEWAY	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 21-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 21-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is responsive to the amendment after non-final filed on 28 September 2009.
2. Claims 1-3 and 21-26 remain pending and are considered below.

Response to Amendment

3. The rejections of claims 1-3, 21 and 22 under 35 USC § 112 are withdrawn in view of Applicant's amendments.
4. Applicant's amendments do not overcome the rejections of claims 23-26 under 35 USC § 112.

Response to Arguments

5. Applicant's arguments filed 28 September 2009 have been fully considered but they are not persuasive.

Applicant argues that Zimmerman does not teach spectrally flattening a portion of an audio signal where the classification of the audio signal is unknown. However, Zimmerman was used to show that it was well known to spectrally flatten an audio signal before performing LPC calculations on the signal. This well known method was applied on Abe's audio signal for which classification is unknown before and during LPC calculations (FIG. 3, item 13 and related text and col. 11, lines 21-25. Note that the classification of the audio signal is unknown before classification).

Claim Objections

6. Claims 1 and 21 are objected to because of the following informalities: it is believed “Spectrally flattening the portion of the audio signal” (emphasis added) in line 3 of claim 1 should be ‘Spectrally flattening a portion of the audio signal’ because there is no antecedent basis for “portion”. In claim 21, it is believed “spectrally flattened decimated portion” (emphasis added) in the last line should be ‘spectrally flattened portion’ because there is no antecedent basis for “decimated portion”.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 23-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 recites “A first circuit for spectrally flattening the portion of the audio signal, thereby resulting in a spectrally flattened decimated portion of the audio signal” (emphasis added). However, spectrally flattening an audio signal does not lead to a decimation of the audio signal. Further, claim 26, which depends upon claim 23, recites “A decimator for decimating the portion of the audio signal”. It is unclear how and why a signal, already decimated (in claim 23), should be decimated again. Also “the portion of the audio signal” in line 3 of claim 23 has insufficient antecedent basis in the claim. For the above cited reason “A first circuit for spectrally flattening the portion of the audio

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signal, thereby resulting in a spectrally flattened decimated portion of the audio signal” (emphasis added) will be interpreted as ‘A first circuit for spectrally flattening a portion of the audio signal, thereby resulting in a spectrally flattened portion of the audio signal’.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 3, 21, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al (USPN 6,990,443) in view of Zimmerman (US PGPub 2002/0198716).

Claim 1:

Abe discloses a method for classifying an audio signal (Abstract), said method comprising:

calculating a plurality of linear prediction coefficients (LPC) for a portion of the audio signal (FIG. 3, item 13 and related text) wherein classification of the audio signal is unknown (col. 11, lines 21-25. Note that the classification of the audio signal is unknown before classification);

inverse filtering the portion of the audio signal with the plurality of linear prediction coefficients (LPC), thereby resulting in a residual signal (FIG. 3, item 20 and related text);

measuring the residual energy of the residual signal (FIG. 3, items 20, 36, and related text); and

comparing the residual energy to a threshold (“extracting the characteristic quantity of a signal ... and classifying the signal ... according to the characteristic quantity thereof”, col. 3, lines 43-51).

Abe does not explicitly disclose spectrally flattening the portion of the audio signal before performing the LPC analysis.

In an audio processing method, Zimmerman discloses a pre-emphasis step spectrally flattening a portion of an audio signal, thereby resulting in a spectrally flattened portion of the audio signal, before performing an LPC analysis (Fig. step 620 and related text).

It would have been obvious to one with ordinary skill in the art at the time of the invention to have spectrally flattened an audio signal in a pre-emphasis step in order to “to make it less susceptible to finite precision effects in subsequent signal processing” (Zimmerman, [0058]) where the subsequent signal processing may be an LPC analysis (Zimmerman, Fig. 6, step 650 and related text).

Claim 3:

Abe and Zimmerman disclose the method of claim 1, Abe further discloses wherein the portion of the audio signal comprises a frame (FIG. 2 and related text).

Claim 21:

Abe and Zimmerman disclose the method of claim 1, Abe further discloses classifying the audio signal based on the comparison of the residual energy of the spectrally flattened portion (“classifying the signal ... according to the characteristic quantity thereof”, col. 3, lines 43-51).

Claims 23 and 25:

System claims 23 and 25 and method claims 1, and 3 are related as system and the method of using same, with each claimed element’s function corresponding to the claimed method step. Accordingly claims 23 and 25 are rejected with the same rationale as applied above with respect to method claims 1 and 3.

11. Claims 2 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al (USPN 6,990,443) in view of Zimmerman (US PGPub 2002/0198716) and in further view of Koishida et al (USPN 6,658,383).

Claim 2:

Abe and Zimmerman disclose the method of claim 1, but they do not explicitly disclose classifying the portion of the audio signal as music, if the residual energy exceeds the threshold; and classifying the portion of the audio signal as speech, if the threshold exceeds the residual energy.

In a method, similar to Abe’s, of audio classification, Koishida teaches that “linear prediction-based techniques such as CELP can deliver high quality reproduction for speech signals, but yield unacceptable quality for the reproduction of music signals” (col. 1, lines 33-37).

It would have been obvious to one with ordinary skill in the art at the time of the invention to use Abe's residual energy to classify speech and music because as Koishida teaches LPC (linear predictive coding) techniques model speech better than they do music, therefore giving a smaller error (residual energy) for speech signals compared to the error for music signals.

Claim 24:

System claim 24 and method claim 2 are related as system and the method of using same, with each claimed element's function corresponding to the claimed method step. Accordingly claim 24 is rejected with the same rationale as applied above with respect to method claim 2.

12. Claims 22 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al (USPN 6,990,443) in view of Zimmerman (US PGPub 2002/0198716) and in further view of De Lima Araujo et al ("Formant Frequency Estimation Using a Mel Scale LPC Algorithm", In Proc. of ITS '98, IEEE Intl., Vol. 1, 1998, pp. 207-212).

Claim 22:

Abe and Zimmerman disclose the method of claim 1, but they do not explicitly disclose decimating the portion of the audio signal before spectrally flattening it.

In a speech processing method, De Lima Araujo discloses decimating a portion of a speech signal before a pre-emphasis step (page 209, col. 1, paragraphs 5 and 6).

It would have been obvious to one with ordinary skill in the art at the time of the invention to have decimated Abe in view of Zimmerman's audio signal before spectrally

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flattening in a pre-emphasizing step in order to reduce fusion errors (De Lima Araujo, page 209, col. 2, paragraph 1).

Claim 26:

System claim 26 and method claim 22 are related as system and the method of using same, with each claimed element's function corresponding to the claimed method step. Accordingly claim 26 is rejected with the same rationale as applied above with respect to method claim 22.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAMUEL G. NEWAY whose telephone number is (571)270-1058. The examiner can normally be reached on Monday - Friday 8:30AM - 5:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626

/S. G. N./
Examiner, Art Unit 2626